DELIVERING GREEN INITIATIVES WITH AI-ENABLED AUTONOMOUS SOLUTIONS TO BOOST PORT INDUSTRY

Dr Rafiq Swash, CEO and Founder, AIDrivers

As the US inaugurates its 46th president and re-joins the Paris Climate Agreement, the status of climate change will climb back up the global agenda and reignite the need to drive down global carbon emissions.

The US is the world's largest economy and the second biggest emitter of carbon so gives this cause true political heft. Joe Biden's decision to re-enter the accord will increase the importance of green issues and spotlight sustainability for other countries to follow suit. There is no better time to focus our attention on our efforts, planning and execution of greener goals.

CREATING SUSTAINABLE PORTS

AIDrivers is committed and fully aware of its role in creating sustainable ports for the future and embraces it wholeheartedly. The drive to innovatively solve for the needs of the port industry is clearly overlaid with the responsibility to provide green, efficient and commercially viable technology to assist ports in sustainable automation as they strive to meet carbon reduction targets.

AIDrivers delivers artificial intelligence (AI) enabled autonomous mobility solutions to the port sector. The cutting-edge technology transforms current fleets of trucks and other port equipment into autonomous vehicles by retrofitting hardware and software onto the existing platforms to render them fully autonomous and self-managed.

COVID-19 has highlighted the need for automation to enable resilient operations to continue under conditions which can change at short notice. As a by-product of recent innovation it is clear that how AIDrivers achieves its advancements and the solutions it delivers carry substantial green credentials and robust business operations.

One of the cornerstones of an AI enabled autonomous fleet is its operational efficiencies with energy saving vehicle scheduling, intelligent path planning for in-time operations as well as V2X for a self-aware connected environment to enable trucks, cranes, traffic lights, smart gates and fuel stations to interact and work together to deliver a common goal of job completion.

This means that vehicles are allocated tasks back-to-back with less wasted travelling between jobs meaning less fuel consumption and a consistent quality of service. The fully connected and self-aware systems understand the operation holistically to deliver increased efficiency and productivity.

AUTOMATION

AI-enabled autonomous automation also cuts fuel emissions due to hyper efficient, purposed equipment handling and usage. The fusion of 3D LiDAR, cameras and sensors overlaid with the AI enabled software algorithms means that vehicles optimise routes and manoeuvres due to the self-aware systems, which reduce unnecessary usage of equipment dynamics such as acceleration and braking. The energy efficient speed therefore results in improved fuel consumption. An adjunct to this is the more effective use of vehicle parts.

AI-enabled autonomous vehicles for ports are a vital part of the total port logistics chain. The uptick in efficiencies experienced from the optimisation of this aspect of the port transport system means that container ship unloading and loading times are dramatically reduced in turn meaning that quayside time for ships is cut and overall, the total logistics momentum is improved significantly which reduces the transhipment cost. The AI-enabled enhancement in the fluidity of the movements of goods portside cuts fuel consumption and idle time and sweats all assets to maximise lifespans of equipment. Using AI enabled autonomous equipment to maximise daily function time and to optimise the length of life cycles is critical to reduce carbon emissions and resource waste.

LIFE-CYCLE SUPPORT

This above point also applies specifically to the truck fleets themselves. The cradle to grave argument of using assets for the full duration of their usable lives rather than replacing them early means less carbon is used in the design and manufacture of new goods. Cutting short the life of a vehicle is costly not only in monetary terms but also for resource reasons.

Indeed, with the self-aware and self-diagnostic capabilities of AI-enabled autonomous vehicles, the life cycle of each vehicle is vastly improved. The intuitive technology can recognise issues as they arise meaning maintenance happens at the right time for the right issue. In turn, this cuts downtime dramatically.

Avoiding unnecessary maintenance cuts not just the use of time but more importantly cuts unnecessary replacement of parts reducing waste. Incrementally this cuts carbon emissions in the provision of needless engine parts. Reducing avoidable wear and tear means vehicles run much more optimally which also leads to less fuel consumption.

One key area often overlooked is the energy consumption used in the design of new products. By taking existing hardware technology and engineering innovative software to combine and upgrade, AIDrivers addresses green energy engineering for energy efficient and sustainable automation.

The starting point of autonomous mobility solutions was originally driven by ports needing quick, low-cost solutions to their transport challenges. The upshot is that AI-enabled autonomous technology is energy efficient and resource effective and much more attractive in cost terms for industrial operations. AIDrivers' technology also boosts operational resilience.

WIDER CONSIDERATIONS

Looking beyond the vehicles themselves, there are further green benefits for the terminal operators from the adoption of autonomous vehicles. Using existing fleets and adapting them to the current environments means that there are fewer, or in some circumstances, no changes made to the port terminals. Indeed, using the existing infrastructure to create self-aware environments rather than building new sites on greenfield plots is inarguably a more sustainable way to develop ports.

This would prevent the destruction of natural habitats, flora and fauna not only on land but in marine environments. Using the current brownfield sites means less unnecessary use of resources, less costs and less environmental impact. This will also prevent the possibility, in some geographies, of the further build out of coastlines into the sea to reclaim land which has been shown to have huge detrimental impact to marine environments.

Using the current port sites means that there has been a huge reduction in expenditure which means capital can be redirected into green initiatives. There is minimal cost involved in upgrading port terminals for the use of AI-enabled autonomous vehicles relative to building new terminals afresh. Therefore, this has to be a win-win situation that ports find themselves in thanks in part to solutions-driven organisations such as AIDrivers.

Cleverly developing methods to convert vehicles and other horizontal transport to driverless status, delivers an array of green solutions to an industry in need of a clean-up. Since January 2020 sulphur emission cuts have been legally enforced for ships. Over the last year the pandemic has propelled the need for greener actions across the port sector as data showed the rapid and substantial cut to carbon dioxide emissions can be achieved. The statistics are clear, a greener future is attainable. The method to get there is what ports need help with and what AIDrivers can solve.

AIDrivers technology has revolutionised port settings globally with the introduction of cost effective, resource efficient and commercially practical mobility solutions which meet industry needs. Successful trials and roll outs in ports show the commitment of port operators to adopt new green strategies and that this aspect of asset development is highly valued.

Emerging from a perspective-changing 2020 pandemic and entering into a new geopolitical paradigm with a fresh US administration, gives the impetus we all need to tackle carbon emissions, reduce our waste and build an environmentally friendly future. AIDrivers is already well on the way to helping deliver Ai enabled solutions for a greener port industry and embraces the challenge.

ABOUT THE AUTHOR

AIDrivers' founder Dr Rafiq Swash of Brunel University London contributes to international research in Ai, visual information search and retrieval, computer vision, 3D sensors, predictive data analytics and automation. Professionally this has expanded into further international leading collaborations in connected robotics, AI enabled automation, sensor intelligence and fusion, digitisation and behaviour and pattern modelling.

ABOUT THE ORGANISATION

AIDrivers provide specialised AI enabled autonomous mobility solutions for port terminal automation that meet the needs of port operators. The company is working passionately to address industrial mobility challenges by optimising industrial operations and improving the quality of service towards a sustainable future.